

CLAIMS

1. A method of removing contaminants from a contaminated gas or vapour stream, which method includes
- 5 passing a contaminated gas or vapour stream through a bed of curled separating media in an upward direction;
- allowing a contaminant in the contaminated gas or vapour stream to collect on the separating media as the gas or vapour stream passes through
- 10 the bed of separating media, thereby removing the contaminant from the gas or vapour stream and thus purifying the gas or vapour stream;
- allowing the contaminant that has collected on the separating media to pass from the separating media into a collection zone;
- removing the contaminant from the collection zone; and
- 15 withdrawing a purified gas or vapour stream from the bed of separating media.
2. A method according to Claim 1, wherein the thickness of the separating media bed is between 3cm and 15cm.
- 20 3. A method according to Claim 1 or Claim 2, wherein the curled separating media each have a dimension or length of between 3mm and 30mm.
- 25 4. A method according to Claim 3, wherein the curled separating media are in the form of metal shavings.
5. A method according to Claim 4, wherein the shavings are less than 1mm thick, and between 1mm and 10mm wide.
- 30 6. A method according to Claim 1 or Claim 2, wherein some or all of the curled separating media are of elongate form and comprise a plurality of full spirals, so that they are then each a spiral separating medium.

7. A method according to Claim 6, wherein each spiral separating medium is of constant diameter along its length, with the spiral separating media being arranged in a regular fashion or pattern in the bed.
- 5 8. A method according to Claim 7, wherein the spiral separating media extend parallel to one another in the bed, and the direction of movement or passage of the gas or vapour stream through the bed is orthogonally to the longitudinal axes of all the spiral separating media.
- 10 9. A method according to Claim 8, wherein the bed comprises a plurality of layers of the spiral separating media, with each layer comprising a plurality of the separating media located adjacent each other, and with each layer of the separating media thus resting on the separating media of the layer below it.
- 15 10. A method according to Claim 9, wherein adjacent separating media in each layer are of opposite hand so that their spirals rotate or extend in opposite directions.
- 20 11. A method according to any one of Claims 1 to 10 inclusive, wherein the gas or vapour stream is at an elevated temperature, with the contaminant being in condensable vaporized form and/or in the form of fine droplets entrained or dispersed in the gas or vapour stream.
- 25 12. A method according to Claim 11, wherein the contaminated gas or vapour stream is a contaminated air stream emanating from a cooking installation, with contaminants in the hot air stream being fat and/or oils which are present in the hot contaminated air stream in the form of fine entrained droplets and/or in vaporized form.
- 30 13. A method according to Claim 12, which includes, prior to passing hot contaminated air through the bed of curled separating media, admixing the hot contaminated air with cold air, which serves to condense any

vaporized fats and oils in the contaminated air so that they are converted into entrained liquid droplet form before encountering the bed of separating media.

14. A method according to any one of Claims 1 to 13 inclusive,  
5 which includes passing the purified gas or vapour stream through a scrubber and/or biological filter to remove an undesired substance therefrom, before discharging the treated gas or vapour stream to atmosphere.

15. A method according to any one of Claims 1 to 14 inclusive,  
10 wherein the contaminated gas or vapour stream passes linearly, in the upward direction, through the bed of separating media.

16. A method according to Claim 15, wherein the linear velocity of the gas or vapour stream through the bed is up to 6m/s.

17. Apparatus for removing contaminants from a contaminated gas or vapour stream, which apparatus includes

a gas/vapour chamber;  
a gas/vapour inlet leading into the chamber;  
20 a gas/vapour outlet leading from the chamber;  
separating means located in proximity to the gas/vapour inlet, the separating means comprising a bed of curled separating media, with the separating means adapted such that a contaminated gas or vapour stream that enters the chamber passes through the bed of curled separating media in  
25 an upward direction, with the curled separating media acting to separate contaminants from the gas or vapour as the gas or vapour stream passes through the bed; and

collecting means for collecting contaminant that has collected on the separating media.

18. An apparatus according to Claim 17, wherein the chamber is defined by a front wall, a rear wall spaced from the front wall, top and bottom walls, and a pair of spaced side walls located between the front, bottom, rear and top walls, with the gas/vapour inlet being provided in the front wall, while

the gas/vapour outlet is provided in one of the other walls, and with the front wall sloping downwardly inwardly from the top wall to the bottom wall, so that it is thus inclined at an angle to the vertical,

5 19. An apparatus according to Claim 18, wherein the front wall is planar.

20. An apparatus according to Claim 18 or Claim 19, wherein the separating means comprises a holder which holds the separating media bed,  
10 with the holder comprising a base, a roof spaced from the base, and a pair of spaced sides between the roof and the base.

21. An apparatus according to Claim 20, wherein the base, roof and sides of the holder are in the form of plates, with the base, roof and side  
15 plates defining, at the front of the holder, a gas/vapour inlet opening, while a gas/vapour outlet opening is defined by the base, roof and side plates at the rear of the holder.

22. An apparatus according to Claim 21, wherein the inlet and outlet  
20 openings are covered by apertured coverings which hold the separating media bed in position.

23. An apparatus according to Claim 21 or Claim 22, wherein the holder is releasably mounted inside the chamber.  
25

24. An apparatus according to Claim 23, wherein the holder is releasably mounted in the gas/vapour inlet of the chamber, so that its plates extend transversely with respect to the chamber front wall and with it thus being located at an angle to the horizontal so that a contaminated gas/vapour  
30 stream that enters the gas/vapour inlet opening of the holder passes upwardly through the separating means before exiting through the gas/vapour outlet opening of the holder.

25. An apparatus according to Claim 24, which includes mounting means mounting the holder releasably to a wall of the chamber.

26. An apparatus according to Claim 25, wherein the holder is provided, in proximity to its gas/vapour inlet opening, with an outwardly protruding flange which engages the front wall of the chamber around the gas/vapour inlet in the chamber front wall.

27. An apparatus according to Claim 26, wherein the mounting means includes retaining means for retaining the holder flange in position against the chamber front wall.

28. An apparatus according to any one of Claims 21 to 27, wherein the collecting means comprises a trough located below the gas/vapour inlet opening of the holder of the separating means.

29. An apparatus according to Claim 28, wherein the trough comprises a base plate, a pair of spaced side plates and a front plate closing off the front edges of the base and side plates, with the base plate of the trough being fast with the base plate of the holder.

30. An apparatus according to any one of Claims 18 to 29 inclusive, wherein the chamber forms part of an air collection hood located above cooking apparatus.

25

31. A holder/trough combination for an apparatus for removing contaminants from a contaminated gas or vapour stream, the combination including

a holder for holding a separating media bed, the holder comprising a base plate, a roof plate spaced from the base plate, and a pair of spaced side plates between the roof and base plates, with the base plate, the roof plate and the side plate defining, at the front of the holder, a gas/vapour inlet opening, while a gas/vapour outlet opening is defined by the base plate, the roof plate and the side plates at the rear of the holder; and

30

a trough located below the gas/vapour inlet opening of the holder.

32. A combination according to Claim 31, wherein the trough comprises a base plate, a pair of spaced side plates and a front plate closing  
5 off the front edges of the base and side plates, with the base plate of the trough being fast with the base plate of the holder.

33. A combination according to Claim 31 or Claim 32, which includes a bed of curled separating media inside the holder.

10

34. A cooking installation which includes  
cooking apparatus on which foodstuffs can be cooked;  
apparatus for removing contaminants from a contaminated air stream,  
according to Claim 30, above the cooking apparatus;  
15 an air extraction conduit leading from the air collection hood of the apparatus such that an inlet to the conduit is in communication with the gas/vapour outlet in one of the walls of the air collection hood; and  
air extraction means in or associated with the extraction conduit.

20 35. An installation according to Claim 34, wherein the conduit is in the form of a duct, with the air extraction means being an extraction fan mounted in the duct.